

CLAIMS

1. A diesel engine comprising:
 - a fuel supply passage via which fuel is supplied from a fuel tank to an oil pan through a supply pump;
 - a lubrication-system fuel supply passage via which fuel is supplied from the oil pan to engine parts to be lubricated through a lubricating oil pump; and
 - an injection-system fuel supply passage via which fuel is supplied from the oil pan to an injection system through an injection pump.
- 10 2. The diesel engine as claimed in claim 1, further comprising:
 - a lubrication-system fuel return passage via which return fuel from the engine parts is returned to the oil pan; and
 - an injection-system fuel return passage via which return fuel from the injection system is returned to the fuel tank.
- 15 3. The diesel engine as claimed in claim 1, further comprising:
 - a lubrication-system fuel return passage via which return fuel from the engine parts is returned to the oil pan; and
 - 20 an injection-system fuel return passage via which return fuel from the injection system is returned to the oil pan.
- 25 4. The diesel engine as claimed in claim 1, further comprising:
 - a lubrication-system fuel return passage via which return fuel from the engine parts is returned to the oil pan; and
 - an injection-system fuel return passage via which return fuel from the injection system is returned to an upstream side of the injection pump.
- 30 5. The diesel engine as claimed in claim 4, further comprising a filter arranged on an upstream side of the injection pump, wherein the return fuel from the injection system passes through the filter.
- 35 6. The diesel engine as claimed in claim 1, further comprising:
 - a lubrication-system fuel return passage through via which return fuel from the engine parts is returned to the oil pan; and
 - an injection-system fuel return passage through which return fuel from the

injection system passes,

wherein the injection-system fuel return passage includes a three-way valve having an adjustable degree of opening, a first passage via which the return fuel distributed by the three-way valve is returned to an upstream side of the injection pump, and a second passage via which the return fuel distributed by the three-way valve is returned to the oil pan.

7. The diesel engine as claimed in claim 6, further comprising a filter provided between the three-way valve and the injection pump.

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8. The diesel engine as claimed in claim 6 or 7, wherein the three-way valve supplies the return fuel toward the injection pump with an increased ratio when the diesel engine is warmed up, and supplies the return fuel toward the oil pan with an increased ratio when the engine is cold.

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9. The diesel engine as claimed in claim 2 or 3, wherein the injection-system fuel supply passage includes a three-way valve having an adjustable degree of opening, and a fuel pipe for a supply of fuel from the fuel tank is connected to the three-way valve.

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10. The diesel engine as claimed in claim 9, further comprising a filter provided between the three-way valve and the injection pump.

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11. The diesel engine as claimed in claim 9 or 10, wherein the adjustable degree of opening of three-way valve depends on the temperature of fuel.

12. The diesel engine as claimed in claim 3, wherein the injection-system fuel return passage returns the return fuel to given parts among the engine parts before returning the return fuel to the oil pan.

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13. The diesel engine as claimed in claim 12, wherein the return fuel is returned to a valve train system, and the fuel passing through the lubrication-system fuel supply passage is supplied to a cylinder block.

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14. The diesel engine as claimed in claim 1, further comprising: a lubrication-system fuel return passage via which return fuel from the engine

parts is returned to the oil pan; and

an injection-system fuel return passage through which return fuel from the injection system passes,

wherein the injection-system fuel return passage includes a three-way valve

- 5 having an adjustable degree of opening, a first passage via which the return fuel distributed by the three-way valve is returned to the oil pan, and a second passage via which the return fuel distributed by the three-way valve is returned to the fuel tank.

15. The diesel engine as claimed in claim 14, wherein the return fuel from
10 the injection system is returned, via the first passage, to the oil pan via given parts among
the engine parts.

16. The diesel engine as claimed in any of claims 1 to 15, wherein a suction
port of the injection-system fuel supply passage in the oil pan is located at a position higher
15 than that at which a suction port of the lubrication-system fuel supply passage is located.

17. The diesel engine as claimed in any of claims 1 to 16, wherein:
the supply pump in the fuel supply passage is a mechanical supply pump driven
by a crankshaft;
20 a three-way valve and a regulator are arranged in this order toward a downstream
side from the mechanical supply pump; and
a return pipe is arranged via which excessive fuel from the mechanical supply
pump is returned to an upstream side of the mechanical supply pump by controlling the
adjustable degree of opening of the three-way valve.

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18. The diesel engine as claimed in any of claims 1 to 16, wherein the supply
pump is an electrically powered pump, and a discharge amount of the electrically powered
pump is controlled based on an engine condition.